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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/730,158	12/05/2000	Robert A. Lieberman	99/105	6863

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EXAMINER

LAVARIAS, ARNEL C

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 01/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/730,158

Applicant(s)

LIEBERMAN ET AL.

Examiner

Arnel C. Lavarias

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2872

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 17-19, 21-23 and 25-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 17-19, 21-23 and 25-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 02 December 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. ✓ The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 12/2/02 have been accepted. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Response to Amendment

2. The amendments to the specification of the disclosure in Paper No. 12, dated 12/2/02, are acknowledged and accepted.
3. The amendments to Claims 1, 7, and 27 in Paper No. 12, dated 12/2/02, are acknowledged and accepted.

Allowable Subject Matter

4. The indicated allowability of Claims 6-8, 18-19, 22-23, and 25 is withdrawn in view of the newly discovered reference(s) to DiGiovanni et al. (U.S. Patent No. 5572618) and Yunoki (U.S. Patent No. 6097874) and to matters of enablement in these claims. Rejections based on the newly cited reference(s) follow.

Response to Arguments

5. In view of the amendments to the claims, the objections to Claims 6-8, and 27 are respectfully withdrawn.
6. The Applicants argue that Tarbox fails to teach or reasonably suggest the fiber having at least one parameter that varies from an input end of the fiber to an output end thereof in a manner to maintain a constant power loss per unit length over the length of the fiber. After careful review of the Tarbox reference, the Examiner agrees respectfully withdraws the rejections to Claims 1-5, 17, 21, 26, and 27. Claims 1-6, 17-18, 21-22, 26-27 are now rejected as follows.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
8. Claims 7-8, 19, 23, and 25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

These claims recite the parameter that varies from the input end of the fiber to the output end of the fiber in a manner to maintain a constant power loss per unit length being one of the core/cladding refractive index ratio, the absorption coefficient, and the scattering coefficient. This is also recited in the specification of the disclosure (See Page

5), however, one skilled in the art would not be enabled to determine how to vary such parameter and in what manner based on the Applicants' disclosure. The specification additionally provides two purported examples of the claimed invention (See pages 7 and 8 regarding a chemical- and pH-sensitive fiber sensor based on the claimed invention), however, both these examples fail to describe how the fiber structure or parameters are varied to produce the requisite results of maintaining a constant power loss per unit length.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 6, 17-18, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over DiGiovanni et al. in view of Tarbox or Yunoki.

DiGiovanni et al. discloses an optical fiber, said fiber (See Figures 2A or 2B) having a core and a sheath (See 22, 24, 26 in Figures 2A and 2B), said fiber having at least one parameter (See Figure 2B; col. 5, lines 28-35, the parameter being a variation in the cladding and/or core diameter due to the presence of the tapered region) that varies from an input end of said fiber to an output end thereof in a manner to provide a power loss per unit length over the length of said fiber (See col. 4, line 18-col. 5, line 35). Digiovanni et al. additionally discloses the one parameter comprising an increase in the diameter of the

core from the input to the output end (See Figure 2B; col. 5, lines 28-35; in particular see the tapered region of the fiber in Figure 2B which shows both a change, increasing and decreasing, in the core and cladding diameter of the fiber). DiGiovanni et al. lacks the power loss per unit length being constant over the length of the fiber. However, both Tarbox and Yunoki both teach optical fiber attenuators (See Figures 1 or 2 of Tarbox; Figure 2 of Yunoki) wherein the power loss per unit length is made constant over the length of fiber by careful bending of the fiber (to reduce/adjust bending losses in the attenuator) and by adjustment of the concentration of dopants incorporated into the fiber (to adjust the overall attenuation of the fiber) (See 18 in Figures 1 or 2; col. 2, line 66-col. 3, line 9 of Tarbox; col. 2, lines 12-42; col. 3, lines 1-46 of Yunoki). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the power loss per unit length being constant over the length of the fiber, as taught by either Tarbox or Yunoki, in the optical fiber of DiGiovanni et al. One would have been motivated to do this to provide easy and accurate control over the attenuation characteristics, while reducing cost of fabrication of the attenuator.

11. Claims 3, 5, 21, 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamburger et al. in view of DiGiovanni et al. in view of Tarbox or Yunoki.

Hamburger et al. discloses a distributed fiber optic sensor comprising a multimode optical fiber (See 12, 14 in Figures 1 and 2; col. 2, lines 40-65; col. 5, lines 9-15) having a core (See 12 in Figure 1) and a permeable cladding (See 14 in Figure 1 or 2; col. 2, line 66-col. 3, line 10), said cladding including a composition responsive to an external material to generate a light signal characteristic of that response (See col. 3, line 43-63;

col. 5, line 16-col. 6, line 9). Hamburger et al. additionally discloses a light sensor at an output end (See 24 in Figure 2) and a light source in an input end (See 22 in Figure 2).

Hamburger et al. lacks the fiber having at least one parameter that varies as a function of position within the fiber to compensate for any non-linear power loss over the length of said fiber. However, DiGiovanni et al. in view of Tarbox or Yunoki teaches the optical fiber as disclosed above in Claim 1. Therefore, it would have been obvious to one having ordinary skill at the time the invention was made to incorporate the optical fiber of DiGiovanni et al. in view of Tarbox or Yunoki in the distributed fiber optic sensor as disclosed by Hamburger et al. One would have been motivated to do this to provide a highly uniform attenuation characteristic throughout the length of the optical fiber, therefore allowing for predetermined lengths of optical fiber to be cut which provide a required attenuation value.

12. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamburger et al. in view of DiGiovanni et al. in view of Tarbox or Yunoki as applied to Claim 1 above, and further in view of Cramp et al.

Hamburger et al. in view of DiGiovanni et al. in view of Tarbox or Yunoki discloses the invention as set forth above in Claim 1. Hamburger et al. in view of DiGiovanni et al. in view of Tarbox or Yunoki lacks the optical fiber wherein the core is fabricated in a manner to be sensitive to a target chemical or a physical quantity. However, Cramp et al. teaches that the core (See 2 of Figure 1; 14 in Figure 2; 22 in Figure 3) of a distributed optical fiber sensor can be modified, such as by making the core porous (See col. 3, line 67-col. 4, line 11) or treating the core with a material sensitive to a target chemical (See

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col. 4, lines 12-26), to make the sensor sensitive to analyte to be detected. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the core of the fiber, as taught by Cramp et al., in the optical fiber as disclosed by Hamburger et al. in view of DiGiovanni et al. in view of Tarbox or Yunoki. One would have been motivated to do this to decrease the response time of the sensor since detection occurs without the presence of a fiber cladding layer.

Conclusion

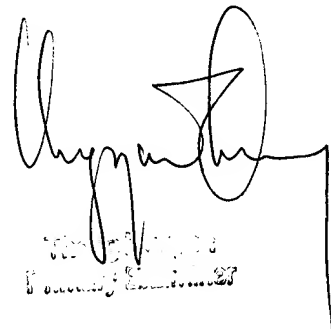
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM.

The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Arnel C. Lavarias
January 16, 2003



Arnel C. Lavarias